1999 SHARK EVALUATION ANNUAL REPORT

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SUMMARY

The Atlantic Shark Fishery Management Plan requires an annual report evaluating the status of shark fishery resources. The information presented herein is an update of shark landings and catches up to 1998.

BACKGROUND

The original Fishery Management Plan (FMP) for Sharks of the Atlantic Ocean was first implemented on 26 April 1993. Its main objectives were to: 1) prevent overfishing of shark resources; 2) encourage management of shark resources throughout their range; 3) establish a shark resource data collection, research, and monitoring program; and 4) increase the benefits from shark resources to the U.S. while reducing waste, consistent with the other objectives. During preparation of the FMP, it was determined that stocks of Atlantic large coastal sharks were below the level required to produce the maximum sustainable yield (MSY). In addition, the FMP called for an annual evaluation of information on shark landings, current stock condition, and information on which to base the total allowable catch (TAC).

After implementation of the FMP, NMFS convened three Shark Evaluation Workshops (SEW 1994, 1996, and 1998) as a mechanism to examine the available shark data and provide scientific advice to facilitate the evaluation of Atlantic shark resources. The 1998 Shark Evaluation Workshop was held at the Southeast Fisheries Science Center (SEFSC), Panama City Facility in June 1998. The report developed on the basis of the Workshop discussions reported that:

"...The 1997 data indicated that commercial catches were, indeed, reduced relative to 1995 by more than 50% in numbers. However, recreational catches were reduced by only 12%. The recreational catch in numbers in 1997 was estimated to be greater than the commercial catches.

The most recent catch rate data corresponding to 1996 and 1997 continue to show inconsistent trends either upward or downward, and many of these trends are

statistically insignificant. However, this is expected: although the fishery has now been regulated for five years, given that the expected rates of change in shark abundance are low and that the measures of stock abundance used are uncertain, a longer time series of catch rate estimates will be required to detect significant changes in stock size since implementation of the most recent management measures.

...Production model analyses utilizing catch, catch rate and demographic data were integrated using Bayesian statistical techniques. For the large coastal aggregation: current (1998) stock size was estimated to be between 30 and 36% of MSY levels, and 1997 catch was estimated to be 218-233% of MSY (the ranges are defined by the mean values from two alternative catch scenarios). When analyses were disaggregated into sandbar and blacktip sharks, then for sandbar current stock size was estimated to be between 58 and 70% of MSY levels, and 1997 catch was estimated to be 85-134% of MSY. For blacktip, current stock size was estimated to be between 44 and 50% of MSY levels, and 1997 catch was estimated to be 163-184% of MSY. Thus, projections indicated that the large coastal aggregate complex might still require additional reductions in effective fishing mortality rate in order to ensure increases of this resource toward MSY. For the blacktip shark, projections also indicated a need for additional reductions, but it is unclear whether reductions in the U.S. alone would achieve the intended goals. Projections for sandbar were more optimistic, suggesting that current catches are closer to replacement levels.

On the basis of recent life history analyses of the sandbar shark showing that large juvenile and subadult individuals are likely to be the most sensitive stages in this species, it was concluded that management approaches should be aimed at reducing fishing mortality in these stages. A minimum size limit of about 140 cm fork length on the "sandbar-like" ridgeback sharks was identified as a possible strategy to reduce mortality in juvenile and subadult stages of sandbar sharks. Additionally, using similar life history arguments, a minimum size was also suggested for the "blacktip-like" non-ridgeback sharks as a strategy for reducing fishing mortality. However, in the case of blacktip, it is expected that a commercial minimum size might not achieve desired results due to mortality of undersized blacktips during normal fishing operations."

Atlantic shark resources will now be managed under the new Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (HMS FMP), to be implemented on July 1, 1999. One of the main objectives of the HMS FMP is to prevent or end overfishing of Atlantic tunas, swordfish and sharks and adopt the precautionary approach to fishery management. To achieve this and other objectives, after consideration of the 1998 SEW Report and other pertinent factors, NMFS will implement the following management measures (as well as others not listed below) for Atlantic shark resources under the HMS FMP: 1) reduce the annual commercial quota for large coastal sharks to 816 mt dw, apportioned between ridgeback (620 mt) and non-ridgeback (196 mt) sharks; 2) reduce the annual commercial quota for small coastal sharks to 359 mt dw; 3) reduce the annual commercial quota for pelagic sharks to 488 mt dw and establish a separate annual commercial quota of 92 mt dw for the porbeagle and an annual dead discard quota for blue sharks of 273 mt dw; 4) establish a minimum size of

137 cm fork length for ridgeback sharks; 5) reduce the recreational bag limit to 1 shark per vessel per trip, with a minimum size of 137 cm fork length for all sharks, and an additional 1 Atlantic sharpnose shark per person per trip; and 6) prohibit possession of 19 species of sharks (Atlantic angel, basking, bigeye sand tiger, bigeye sixgill, bigeye thresher, bignose, Caribbean reef, Caribbean sharpnose, dusky, Galapagos, longfin mako, narrowtooth, night, sand tiger, sevengill, sixgill, smalltail, whale and white).

A Shark Evaluation Workshop was not reconvened in 1999 because the amount of new information collected in one year is insufficient to warrant a full new evaluation. This report represents the 1999 annual evaluation required by the FMP, and is focused on updating landings up to 1997 and providing estimates for 1998 landings of Atlantic sharks harvested by US fishers.

CATCH AND LANDINGS

U.S. Atlantic shark catches increased rapidly during the late 1980's and early 1990's to more than 9,500 mt, but have recently been limited by a suite of regulations including commercial quotas and recreational bag limits. Because species-specific catches of sharks were not documented until 1994, they are grouped by similar life-history and habitat characteristics for the purpose of management. Most of the recent U.S. catch of sharks for the market is of species grouped as large coastal sharks (e.g., blacktip, sandbar, dusky, spinner sharks, etc.). Some pelagic sharks (e.g., mako, thresher, porbeagle) are also highly valued by U.S. fishers targeting tunas and swordfish.

Estimates of total catch and dead discarded large coastal sharks for the period 1981-1997 were summarized in Table 2 of the 1998 Report of the Shark Evaluation Workshop. Updated catches up to 1997 and estimated catches for 1998 were added and presented in Table 1 herein.

Commercial Landings

As has been reported previously, the U.S. commercial shark fishery is primarily a southern coastal fishery extending from North Carolina to Texas. About 90% of recent U.S. Atlantic Large Coastal shark landings came from the southeastern region. The most sought-after species in this fishery are blacktip and sandbar sharks, although others are also taken (SB-III-1).

U.S. commercial landings of Atlantic Sharks in 1996-1998 were compiled based on Northeast Regional general canvass data, Southeast Regional general canvass landings data, and the SEFSC quota monitoring data based on southeastern region permitted shark dealer reports. Landings prior to 1996 were taken as reported in the 1998 Shark Evaluation Report. Landings in southeastern states reported in the general canvass and quota monitoring data files were combined to define the species composition and volume

Table 1. *Estimates of Total Landings and Dead Discards for Large Coastal Sharks (numbers of fish in thousands), modified from 1998 Report of the Shark Evaluation Workshop.*

Year	Col 1 Commercial Landings	Col 2 Longline Discards	Col 3 Rec. Catches	Col 4 Unre-ported	Col 5 Coastal Discards	Col 6 Menhaden Fishery bycatch	Col 7 Total
81	16.2	0.9	265.0				282.1
82	16.2	0.9	413.9				431.0
83	17.5	0.9	746.6				765.0
84	23.9	1.3	254.6				279.8
85	22.2	1.2	365.6				389.6
86	54.0	2.9	426.1	24.9			508.0
87	104.7	9.7	314.4	70.3			499.0
88	274.6	11.4	300.6	113.3			699.9
89	351.0	10.5	221.1	96.3			678.8
90	267.5	8.0	213.2	52.1			540.8
91	200.2	7.5	293.4	11.3			512.3
92	215.2	20.9	304.9				541.1
93	169.4	7.3	249.0		17.6		443.3
94	228.0	8.8	160.9		22.8	26.2	446.7
95	222.4	6.1	176.3		22.2	24.0	451.0
96	170.5	5.7	188.5		17.0	25.1	406.8
97	104.4	5.9	165.1		10.3	25.1	310.8
98	151.5	5.9	160.4		9.6	25.1	352.5

Column 1, commercial landings - These data are the landings reported under the established NMFS cooperative statistics program. (See document SB-III-6 for a description of this data collection program.) The data are collected in landed or dressed weight. Various sources of weight per fish estimates were used to convert pounds to numbers of fish. For the period 1981 through 1985, a generic factor of 45 pounds dressed weight per fish was used. For 1986 through 1991, an average weight for all species was used. These averages are the ones that were used in the 1992 assessment. For 1992 and 1993, average weights for coastal species observed in longline catches were used in document SB-III-6, but the group felt that these weights were too high to apply to fish caught nearer shore in the directed large coastal fishery. Therefore, a weight of 40 pounds per fish was used for these two years. For 1994 through 1997, predicted weights from lengths based on the observer program (Branstetter and Burgess 1997) and data from the pelagic longline database were used. The same average weight used for 1997 was applied to 1998 because no average weights were available.

Column 2, pelagic longline discards - The data for this column are from the analyses of the discards by pelagic longline vessels (see document SB-III-4). The estimates prior to 1987 are calculated using the average ratio of the discards to commercial landings for the data for 1987 through 1992 (discards as a fraction of combined landings and discards averaged 5.12% over this period). A fraction of 3.91% (average for 1993-1997) was assumed for 1998 since data to support a new estimate for 1998 were not yet available.

Column 3, recreational harvest - These data are updated from data originally reported in document SB-III-5 and include estimated catches from the NMFS MRFSS, Headboat and charter boat surveys and the Texas Parks and Wildlife (TPWD) recreational creel survey. The estimate for 1998 is based on catches reported from MRFSS and assuming that catches from the Headboat and TPWD surveys were the same as those reported for 1997 since catches from these two sources were not yet available for 1998.

Column 4, unreported catches - These data are from a single source, which owned a fleet of vessels that fished in the Gulf of Mexico and off the coast of North Carolina. The estimate for 1988 was determined from company landings records. The estimates for other years were prorated based on the 1988 landings record and financial statements indexing income from shark fishing (SB-III-30). The Working Group did not have any way of determining the amount, if any, of these catches that were included. Therefore, the Working Group made the assumption that none of the catches were included and kept these data separate, listing them as unreported. The implicit assumption in doing this is that the landings were off-loaded in Alabama docks, but not sold to Alabama dealers.

Column 5, discards by coastal fishery - These data are from the Gulf and South Atlantic Fisheries Development Foundation/University of Florida observer program (SB-III-1) and show that slightly more than 10% of large coastal species were discarded by the directed fishery in 1994 and 1995. The calculated percentages for 1994 and 1995 were averaged and applied to the recorded landings for 1993 to give an estimate of the discards in 1993. A 10% discard fraction was also assumed for 1996 and 1997, and a 6.4% discard rate was applied in 1998 based on data from Florida's East and West coasts and North Carolina. The discarded species are non-marketable animals that are included in the large coastal management unit.

Column 6, bycatch by menhaden fishery - These data are bycatch estimates of large coastal sharks in the US Gulf of Mexico menhaden fishery for 1994-95 (de Silva et al. in press). It was estimated that 75% of the sharks encountered died and that about 97% of all sharks observed were large coastal sharks. The average for 1994 and 1995 was used as an estimate for 1996-98.

Column 7, total - The numbers in this column are the sum of columns 1-6.

of landings. The quota monitoring data provided a more diverse species listing than the general canvass data, while the general canvass data apportioned a higher volume of shark landings as unclassified. The larger reported landing of a given species in the two data sets was taken as the actual landed volume for that species. The positive difference between the quota monitoring data and the general canvass data was then subtracted from the unclassified sharks category of the general canvass data to maintain the total landings volume equal to that reported in the general canvass data files. For the state of North Carolina (NC), it was believed that some dogfish may have also been assigned to the unclassified sharks category. To adjust for this possibility for the state of NC, the NC unclassified sharks were first apportioned between the large coastal, small coastal, pelagic and dogfish categories based on the reported distribution of landings by species and gear for that state. For states other than NC, the remainder of unclassified shark landings was assigned to the large coastal group unless the harvesting gear was pelagic longline, in which case the landings were assigned to the Pelagic group. The resulting commercial landings estimates for 1998 are shown in Table 2 below. Note that estimates do not include Puerto Rico landings as they were not yet available.

Table 2. *Estimated U.S. Atlantic Shark Landings in 1998 for the Large and Small Coastal and Pelagic Management Groups. All landings are dressed weights.*

Large Coastal Sharks	Landed lbs	**Small Coastal Sharks**	Landed lbs	**Pelagic Sharks**	Landed lbs
Shark, bignose	50	Shark, Atlantic sharpnose	230,920	Shark, bigeye thresher	1,403
Shark, blacktip	1,893,805	Shark, blacknose	119,689	Shark, blue	706
Shark, bull	27,389	Shark, bonnethead	13,949	Shark, shortfin mako	222,920
Shark, dusky	81,124	Shark, finetooth	267,224	Shark, longfin mako	4,410
Shark, hammerhead	59,802	Shark, unc	82	Shark, mako	79,773
Shark, lemon	23,232			Shark, oceanic whitetip	22,049
Shark, night	3,289			Shark, porbeagle	19,795
Shark, nurse	2,846			Shark, thresher	102,530
Shark, reef	100			Shark, pelagic	111
Shark, sand tiger	38,791			Shark, unc	49,502
Shark, sandbar	1,077,161				
Shark, silky	13,615				
Shark, spinner	16,900				
Shark, tiger	12,174				
Shark, large coastal	172,038				
Shark, unc	1,038,530				
Shark, unc, fins	76,588				
Total:	4,537,434 (2,058 mt)	Total:	631,864 (287 mt)	Total:	503,199 (228 mt)

Shark Fishery Observation Information

As reported to the 1996 and 1998 Shark Evaluation Workshops, information from observer sampling on board directed effort shark vessels (SB-IV-1,2,3) was summarized to obtain information on the average size of sharks harvested by the commercial fleet. The measured average size of the observed component of the large coastal shark catch in 1996 was 20.34 kg (44.8 lb) dressed weight, based on a sample of 264 specimens weighed, while in 1997 the average size of the observed component of the large coastal shark catch was 19.75 kg (43.5 lb) dressed weight, based on a sample of 224 specimens weighed. These average sizes are inconsistent with the average weights predicted from lengths of measured fish from the same survey program (see SB-IV-12). Applying weight-length regressions summarized in SB-III-5 results in fork length-predicted average weights of 14.0 kg (30.83 lb) and 13.58 kg (29.94 lb) dressed weight, from 2,836 and 2,425 fish fork lengths in 1996 and 1997, respectively. Differences in predicted and observed sample weights likely result from the opportunistic nature of weight measures made during the observer program (K. Johns, Univ. Florida, personal communication). Over the period 1994-1997, the number of shark weight observations has diminished (SB-IV-12) and no weight observations were available from this program in 1998. For the estimates in Table 1, it is assumed that average weights predicted by fork length (SB-IV-12) are a closer approximation to the actual dressed weights of sharks caught in the commercial fishery.

In 1996 the estimated U.S. commercial landings of Atlantic large coastal sharks were 2,387 mt dressed weight (about 117,400 – 170,500 fish, depending on average size data) and in 1997 landings were 1,418 mt (about 71,800 – 104,400 fish depending on average size assumptions). Assuming the same average sizes as in 1997, the estimated landings for 1998 (2,058 mt) represented about 104,200 – 151,500 fish, depending on average size data). These levels represent a reduction from peak recorded commercial landings (about 4,600 mt, approximately 350,000 fish in 1989; SB-III-6) of this grouping of sharks. While commercial catches of large coastal sharks in numbers in 1997 were estimated to be less than 50% of those in 1995 (Table 1), catches in numbers for 1998 are estimated to be 45% higher than 1997 catches.

Recreational Harvest Estimates

Recreational fishing for sharks also results in significant harvests of large coastal (and other) shark species (SB-III-5). Recreational harvests of sharks occur all along the U.S. Atlantic and Gulf of Mexico coasts. Recreational harvests of the large coastal grouping of sharks were estimated to be on the order of 176,000 fish for 1995, 188,500 fish for 1996, and 165,000 fish for 1997. An estimated 152,000 fish were landed by the recreational sector in 1998, but this figure does not include catches from the Headboat and Texas Parks and Wildlife Department surveys, which were not yet available. If catches of large coastal sharks from these two surveys are assumed to be equal to those reported in 1997, the total estimated recreational catches for 1998 are in the order of 160,500 fish (Table 1). These recent estimates are lower than the mid-1980s level of about 375,000 fish (about 3,000 mt). About 23,000 unidentified sharks (about 45 mt) were estimated to have been harvested in 1995, about 27,000 in 1996, about 15,000 in

1997, and about 8,000 in 1998 by the recreational fishery, some of which might have been from the Large Coastal grouping. Recreational catches in numbers in 1998 are estimated to be 91%, 85%, and 97% of those of those in 1995, 1996, and 1997, respectively. The 1996, 1997, and 1998 recreational catches in numbers were greater than those from the commercial sector (Table 1). Recreational harvest estimates are shown in Table 3 below.

Table 3. *Recreational harvest estimates of U.S. Atlantic Sharks from MRFSS for 1998. Data from the Headboat Survey and Texas Parks & Wildlife were not yet available. All catches are in numbers.*

Large Coastal Sharks	Catch	**Small Coastal Sharks**	Catch	**Pelagic Sharks**	Catch
Shark, blacktip	76,522	Shark, Atlantic angel	107	Shark, blue	6,003
Shark, bull	802	Shark, Atlantic sharpnose	42,048	Shark, shortfin mako	5,581
Shark, dusky	4,277	Shark, blacknose	9,578	Shark, thresher	36
Shark, great hammerhead	441	Shark, bonnethead	26,191		
Shark, hammerhead genus	384			Total:	11,619
Shark, lemon	1,992				
Shark, nurse	2,690				
Shark, requiem family	13,870				
Shark, requiem genus	2,635				
Shark, sandbar	33,245				
Shark, scalloped hammerhead	1,101				
Shark, silky	5,039			**Unknown Sharks**	
Shark, smooth hammerhead	370				
Shark, spinner	7,119			Shark, unc.	7,666
Shark, tiger	1,302				
Total:	151,791	Total:	77,924	Total:	11,619

Bycatch and Discard of Sharks.

As reported in the 1996 and 1998 Shark Evaluation Reports, bycatch of sharks is also known to occur in trawl, set-net and hook and line fisheries. For instance, in the Gulf of Mexico, shark bycatch by the U.S. shrimp trawl fleet consists mainly of sharks too small to be highly valued in the commercial market (SB-III-23). Bycatch of sharks in trawl and other fisheries outside of the Gulf of Mexico also likely occurs with regularity. Pelagic fisheries targeting swordfish and tunas can, at times have shark bycatches that exceed the targeted species catch. In the U.S. longline and drift gillnet fisheries, logbook and scientific observer reports indicate shark bycatch varies with target species (e.g., yellowfin tuna, bigeye tuna or swordfish), gear characteristics and fishing season. Estimates of the annual dead discarded tonnage of large coastal sharks by these U.S. fisheries between 1987 and 1995 range from about 140-875 mt (approximately 6,000-21,000 fish; SB-III-4). Estimates for 1996 were provided in Cramer et al. (1997) and for 1997 in Cramer and Adams (SB-IV-33). For 1996 and 1997, approximately 5,700-5,900 large coastal sharks per year were estimated to have been discarded dead by these fleets; discard estimates for 1998 were not yet available. Observer data collected from the directed shark fishery (SB-IV-1,2,3) indicate the landed catch of large coastal sharks

from the fishery represents about 90% of the total mortality attributable to the large coastal grouping harvested by the fishery.

Another source of data from bycatch of sharks in the Gulf of Mexico menhaden fishery operating mainly off Louisiana was made available for this assessment for the period 1994-1995 (de Silva et al., in press). It was estimated that 75% of the sharks encountered in this fishery died; 97% were large coastal and 3% were small coastal sharks. The total estimated number of sharks caught by this fishery was about 36,000 in 1994 and 33,000 in 1995, or about 26,200 (36,000×0.75×0.97) large coastal sharks in 1994 and 24,000 large coastal sharks in 1995. The average number of large coastal sharks caught in this fishery during 1994-95 (25,100 fish) was used as an estimate for 1996-98.

Species-Specific Catch Histories.

For the purpose of development of species-specific assessments, estimates of the historical catch time series for blacktip and sandbar sharks were prepared based on estimated area and gear specific landings by year. Estimated catches of blacktip (Table 4) and sandbar (Table 5) sharks were based on the proportional allocation of commercial landings of unclassified sharks by gear type and region defined in SB-IV-31 for the period 1986-1995 and using the species breakouts defined in SB-IV-12 for 1996 and 1997 and in Table 2 for 1998. Unclassified sharks in 1996, 1997, and 1998 attributed to the large coastal grouping were proportionally allocated to sandbar and blacktip sharks, respectively, based on the species-specific landings identified in SB-IV-12 and Table 2. Unreported landings were based on the assumed proportions of the values reported in Table 1 of SB-IV-12: 75% blacktip and 25% sandbar for the period 1986-1987, and 50% blacktip, 50% sandbar for the period 1988-1991. Species-specific recreational catches are as reported in SB-III-7, SB-IV-12, and Table 3 for 1998. Levels of dead discarded blacktip and sandbar sharks are assumed to be negligible for U.S. pelagic longline fisheries. Average weights for these species are taken as predicted weights from fork length measures from Table 5 of SB-IV-12 (Rev) for the period 1994-1997; 1997 values were also used for 1998 because no average weights were available for blacktip or sandbar sharks for 1998. Prior to 1994, values assumed are indicated. Estimates of numbers of sharks caught and landed by the directed commercial fleet are taken as estimates of lb (dressed) landed/average wt (dressed lb). Mexican catches are as reported in Table 4 of the 1998 SEW report, with catches for 1998 assumed to be equal to those in 1993-1997.

Bycatch of blacktip and sandbar sharks in the Gulf of Mexico menhaden fishery (de Silva et al., in press) was also incorporated in this assessment. Blacktip sharks made up 35.3% of the total bycatch observed during 1994-95. An additional group described as “mixed blacktip and spinner sharks” made up 20.1% of the total. Assuming that half of the sharks in this mixed group were blacktips, this species would make up about 45.3% of the total bycatch. Considering that 75% of all sharks encountered died, about 12,200 (36,000×0.453×0.75) and 11,200 blacktips would have died as bycatch in 1994 and 1995, respectively. Sandbar sharks only contributed 1.8% to the total species

composition of the bycatch in this fishery during 1994-95 and about 486 (36,000×0.018×0.75) and 445 sandbars, would have died as bycatch in 1994 and 1995, respectively. The averages of the 1994 and 1995 values (11,700 fish for blacktips and 465 fish for sandbars) were used as estimated dead bycatch for 1996-98.

Table 4. *Estimates of the annual catches of blacktip sharks based on area-gear definitions described in SB-IV-31.*

Year	Blacktip lb landed	Average Wt	lb landed/ Ave Wt	Recreational Harvest	Rec+Com	Unreported	Mexico small fish	Menhaden Fishery bycatch	Total
1986	1213040	20.5	59173	162403	221576	18675	15642		255893
1987	1463544	20.5	71392	129552	200944	52725	22346		276015
1988	3300321	20.5	160991	139809	300800	56650	29050		386500
1989	3832421	20.5	186947	111363	298310	48150	35754		382214
1990	2052287	20.5	100112	94135	194247	26050	42458		262755
1991	2744292	20.5	133868	150794	284662	5650	49161		339473
1992	3610218	20.5	176108	157659	333767		55865		389632
1993	3086965	20.5	150584	109054	259638		62569		322207
1994	3829364	20.0	191468	66106	257574		62569	12200	332343
1995	2915797	20.9	139512	59892	199404		62569	11200	273173
1996	2121714	22.3	95144	79753	174897		62569	11700	249166
1997	1709694	24.0	71237	70963	142200		62569	11700	216469
1998	2499268	24.0	104136	76522	180658		62569	11700	254927

Table 5. *Estimates of the annual catches of sandbar sharks based on area-gear definitions described in SB-IV-31.*

Year	Sandbar lb landed	Average Wt	lb landed/ Ave wt	Recreational Harvest	Rec+Com	Unreported	Menhaden Fishery bycatch	Total
1986	796509	35.9	22187	123661	145848	6225		152073
1987	2285644	35.9	63667	32551	96218	17575		113793
1988	2737938	35.9	76266	64792	141058	56650		197708
1989	4215657	35.9	117428	27415	144843	48150		192993
1990	4026470	35.9	112158	58811	170969	26050		197019
1991	3292594	35.9	91716	36794	128510	5650		134160
1992	3470449	35.9	96671	36294	132965			132965
1993	2483235	35.9	69171	26607	95778			95778
1994	4691470	35.4	132527	14973	147500		486	147986
1995	3012065	36.4	82749	24906	107655		445	108100
1996	2004759	31.1	64462	35711	100173		465	100638
1997	982100	30.8	31886	41618	73504		465	73969
1998	1420914	30.8	46134	33245	79379		465	79844

References Cited

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